

REMARKS

In the present Amendment, the recitations of claims 3, 12, 17 and 22 have been incorporated into claims 1, 10, 15 and 20, respectively, and claims 3, 12, 17 and 22 have been cancelled. Thus, independent claims 1, 10, 15 and 20 now expressly recite that the carbon nanocapsule is a hollow carbon nanocapsule. In addition, claims 4, 13, 18 and 23 have been cancelled. No new matter has been added, and entry of the Amendment is respectfully requested.

Upon entry of the Amendment, claims 1-2, 5-11, 14-16, 19-21 and 24 will be pending.

The Claims Satisfy the Requirements of 35 U.S.C. § 112

At page 2 of the Action, claims 8 and 9 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement.

The Examiner states that claims 8 and 9 contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner states that none of the examples in the specification describe either a cycloaddition or a radical addition reaction. The Examiner states: "It appears that these reactions do not happen."

Applicants respectfully traverse.

The rejection has no merit and should be withdrawn. Under the law, an original claim provides its own written description. Questions of compliance with the written description requirement only arise when a claim is amended during prosecution. At that time, one may question whether the Applicants described as part of their invention, when they originally filed

their application, the subject matter added by amendment. That is not the case here. Claims 8 and 9 are original claims, and they provide their own written description.

Claim 8 is directed to the organically-functionalized carbon nanocapsule as claimed in claim 1, wherein the carbon nanocapsule is functionalized by a cycloaddition reaction. Claim 9 is directed to the organically-functionalized carbon nanocapsule as claimed in claim 1, wherein the carbon nanocapsule is functionalized by a radical addition reaction. Again, these are original claims, and they provide their own written description. There is no question that Applicants described the carbon nanocapsule of claim 1, functionalized by (1) a cycloaddition reaction, and (2) a radical addition reaction, respectively, as part of their invention in their application as filed.

Claims 8 and 9 also satisfy the enablement requirement of section 112, first paragraph. The test of enablement is whether persons skilled in the art would be able to make and use the claimed invention based on the description in the specification, coupled with the knowledge of those skilled in the art. That some experimentation may be required does not defeat enablement, provided that the experimentation required is not “undue.” Furthermore, there is no legal requirement that a patent application provide a working example of each embodiment of the invention. The description in an application is presumptively considered to provide an enabling description, unless the Office sets forth objective reasons as to why the disclosure is not enabling.

Here, the Examiner has simply stated in a conclusory fashion that “It appears that these reactions [recited in claims 8 and 9] do not happen.” This conclusory assertion is insufficient to satisfy the Office’s burden of setting forth objective reasons as to why the disclosure is not enabling.

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In sum, claims 8 and 9 satisfy the requirements of 35 U.S.C. § 112, first paragraph. Reconsideration and withdrawal of the rejection are respectfully requested.

Also at page 2 of the Action, claim 6 is rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite.

The Examiner states that claim 6 is unclear insofar as “D” is a terminal group with two things bonded to it, which is impossible.

In response, Applicants have corrected “--C--D--” in claim 6 to “--C--D”.

It is believed the above amendment overcomes the section 112, second paragraph, rejection of claim 6.

The Claims Are Novel and Non-Obvious (35 U.S.C 102(b) and 103(a))

At pages 3-4 of the Action, claims 1-3, 5-12, 14-17, 19-22 and 24 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as allegedly obvious over Lieber et al. (US 6,159,742).

Applicants submit that this rejection should be withdrawn because Lieber does not disclose or render obvious the organically-functionalized carbon nanocapsules of the present invention.

The independent claims of the present application all call for, inter alia, a carbon nanocapsule having at least one kind of organic functional group bonded thereon. See claims 1, 10, 15 and 20. It is therefore clear that the present invention provides a carbon nanocapsule.

In contrast to the present invention, Lieber fails to teach or suggest forming a carbon nanocapsule.

Specifically, Lieber provides a carbon-based nanotube (see Lieber's abstract and column 1, lines 39-58). Clearly, Lieber fails to disclose forming a carbon nanocapsule. As is known, a carbon nanocapsule is very different from a carbon nanotube in terms of such characteristics as size, aspect ratio and dispersion/aggregation properties. Accordingly, nanocapsules and nanotubes are employed in different fields. For example, low-aspect-ratio nanocapsules are usually used as heat-conducted fluid or drug carriers, whereas high-aspect-ratio nanotubes are used for field emission displays (FEDs), reinforced fibers, conductive films, and atomic force microscope (AFM) probes.

In view of the above, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 1-3, 5-12, 14-17, 19-22 and 24 based on Lieber.

At pages 4-5 of the Action, claims 1-2, 4-5, 7-11, 13-16, 18-21, 23 and 24 are rejected under 35 U.S.C. §103(a) as allegedly being unpatenable over Ruoff (US 5,547,748).

Applicants submit that this rejection should be withdrawn because Ruoff does not disclose or render obvious the organically-functionalized carbon nanocapsules of the present invention.

Independent claims 1, 10, 15 and 20 as amended recite "a hollow carbon nanocapsule, and at least one kind of organic functional groups bonded thereon. . . ." It is therefore clear that the carbon nanocapsule provided by the invention is hollow.

Ruoff fails to teach or suggest forming a hollow carbon nanocapsule. In this regard, it is noted that claims 3, 12, 17 and 22, now incorporated into independent claims 1, 10, 15 and 20, respectively, were not subject to this rejection.

Specifically, Ruoff provides a nanoencapsulate where a metal is encapsulated in a nanopolyhedron (see column 2, lines 30-33 of Ruoff). Clearly, Ruoff fails to disclose a hollow carbon nanocapsule.

In view of the above, the Examiner is respectfully requested to reconsider and withdraw the section 103 rejection of claims 1-2, 4-5, 7-11, 13-16, 18-21, 23 and 24 based on Ruoff.

At pages 5-6 of the Action, claims 1-3, 5-12, 14-17, 19-22 and 24 are rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Lieber (US 6,159,742).

The Examiner states that insofar as the formula for Lieber does not match up to the present formula, it would have been obvious to provide bigger linking groups to be able to sorb more complicated molecules having many binding sites.

Applicants submit that this rejection should be withdrawn for the same reasons that the previously-discussed section 102(b) or, alternatively, section 103 rejection of claims 1-3, 5-12, 14-17, 19-22 and 24 based on Lieber should be reconsidered and withdrawn.

At page 6 of the Action, claims 1-2, 4-11, 13-16, 18-21, 23 and 24 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ruoff (US 5,547,748).

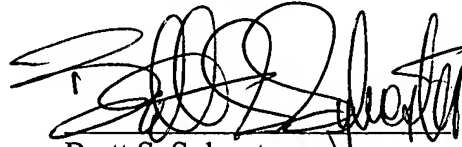
Applicant submits that this rejection should be withdrawn for the same reasons that the preceding rejection based on Ruoff should be withdrawn. As discussed, the recitations of claims 3, 12, 17 and 22 have been incorporated into independent claims 1, 10, 15 and 20, respectively, in the present Amendment. Claims 3, 12, 17 and 22 were not subject to the present rejection.

Allowance is respectfully requested. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Brett S. Sylvester", written over a horizontal line.

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